

HAND-HELD FOOD PROCESSOR

BACKGROUND OF THE INVENTION

The present invention relates generally to food processing devices, and more particularly to an improved hand-held food processor capable of cutting, slicing, shredding or grating foodstuffs loaded into a compartment and fed automatically there through by a releasable spring-driven press mechanism that is activated during operation to facilitate handling and manipulation of the processor by the user.

Food processing devices that can cut, slice, grate and shred food have become a staple product in the household as a sensible and timesaving alternative to manual food preparation. These food processing devices appear in a variety of shapes and sizes with many of them being electrically powered, either by cord connection to an electrical outlet or by a self-contained power supply. In recent times, electrical mini-processors have been developed that are more powerful yet more compact than their predecessors. While these mini-processors have been easier to use and less cumbersome, they are generally designed for stationary use and not for portable, hand-held operation. Because of their characteristic portability, general convenience and stand-by readiness, hand-held food processors, even though typically less powerful than the stationary food processing devices, continue to find favor with consumers in their food preparation activities.

Numerous hand-held devices have been devised for performing any or all of the processing operations of cutting, slicing, grating or shredding of

1 foodstuffs, such as vegetables, fruits and cheeses. One example of a most
recent hand-held food processor is that shown and described in U.S. Patent
No. 6,409,107 (Romano) wherein the foodstuff to be processed is loaded
into a hollow cavity and pushed down and onto a reciprocating cutting blade
5 by the gripping and squeezing action of the user upon a handle-like pusher
and an actuator lever pivotally connected thereto. This completely
manually-powered device is particularly lightweight and easy to handle but
limited, to a certain extent, in the capacity of its hollow cavity and in the
amount of foodstuffs that can be loaded into the cavity and processed
10 effectively at any one time using the normal gripping span of the user's
hand. Other types of prior art hand-held food processors having self-
contained electrical power units with associated motors that drive rotatable
cutting blades, such as those devices shown and described in U.S. Patent
Nos. 4,856,718 (Gaber et al.) and 5,364,037 (Bigelow), effectively process
15 and deliver sliced, shredded or grated foodstuff, as selected, from whole
stock loaded into the processors. However, these and other electrically
powered devices tend to be larger and heavier in size, becoming more
difficult to handle and manipulate, particularly with one hand, and further
rely on battery units to power their motor drives that can discharge rapidly
20 and require frequent replacement or recharging.

While these and other prior art hand-held food processors may be
suitable for their general purposes, there is still a need for improvements in
the ease and effectiveness of the loading and delivery of the foodstuffs to be
processed as well as in facilitating the handling and manipulation of such
25 food processors by the consumer user.

SUMMARY OF THE INVENTION

Accordingly, it is a general purpose and object of the present invention to provide an improved hand-held food processor for cutting, slicing, shredding or grating of various foodstuffs.

A more particular object of the present invention is to provide an improved food processing device that can be effectively operated by hand to cut, grate or shred a variety of foodstuff in a wide range of sizes and deposit the foodstuff in processed form at the location desired by the user.

Another object of the present invention is to provide a hand-held food processor that is completely portable and easy to handle and manipulate during its operation.

Still another object of the present invention is to provide a hand-held food processor that is lightweight and easy to use and effective in its operation without need for electrical power.

A still further object of the present invention is to provide a hand-held food processor that is simple in construction yet reliable in its operation and that is configured for easy storage.

Briefly, these and other objects of the present invention are accomplished by an improved hand-held food processing device for selectively slicing or grating a foodstuff comprising an elongated housing, a lever arm extended substantially through the housing and pivotally coupled thereto under a spring bias, and a processing plate containing a cutting panel slidably disposed at the base of the housing and adapted to engage the pivoting lever arm at its lower tip to provide reciprocating motion relative to the housing. The housing is formed having a narrow grip-like upper section

1 for handling and an expanded bell-shaped lower section with an open bottom
at the base of the housing. The lower section of the housing is further
formed having a forward compartment intended to hold the foodstuff to be
processed. A spring-driven press mechanism is slidably mounted within the
5 forward compartment of the housing and releasably engaged for activation
to push the foodstuff through the compartment and onto the reciprocating
plate for delivery of processed foodstuff from the base of the housing. The
processing plate is adapted to hold different types of cutting panels to
process the foodstuff in various forms.

10 For a better understanding of these and other aspects of the present
invention, reference should be made to the following detailed description
taken in conjunction with the accompanying drawings in which like
reference numerals and characters designate like parts throughout the figures
thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

For a fuller understanding of the nature and object of the present invention, references in the detailed description of the preferred embodiment set forth below shall be made to the accompanying drawings in which:

FIG. 1 is a front perspective view of a food processor device made in accordance with the present invention;

FIG. 2 is a front elevation view of the food processor device shown in FIG. 1;

FIG. 3 is a sectional view of the food processor device taken along line 3-3 of FIG. 2;

FIG. 4 is forward isometric view of a portion of the internal structure of the food processor device of FIG. 1, particularly showing the internal coupling of the press mechanism associated with the present invention;

FIG. 5 is a front perspective view, similar to that of FIG. 1, but partially cutaway to show the internal arrangement of parts of the present food processor device.

FIG. 6 is a plan view of the bottom of the food processor of FIG. 1;

FIG. 7 is a top plan view of an associated processing plate used in the food processor device of FIG. 1 shown removed therefrom;

FIG. 8 is a front perspective view, similar to FIG. 1, but showing the food processor device in operational position activated by the hand of a user shown in phantom; and

FIG. 9 is a side elevation view of the food processor device with portion cutaway to show operational movement of the device in processing foodstuff loaded therein.

DETAILED DESCRIPTION OF THE INVENTION

The following is a detailed description of a preferred embodiment of the present invention and the best presently contemplated mode of its production and practice. This description is further made for the purpose of illustrating the general principles of the invention but should not be taken in a limited sense, the scope of the invention being best determined by reference to the appended claims.

Referring now to the various figures of the drawing, there is shown a hand-held food processor device, generally designated 10, constructed in accordance with the present invention. The present device 10 is arranged and adapted to slice, grate or otherwise cut off portions from an article of foodstuff designated 52 in FIG. 9 (e.g. cheese, garlic, nuts, fruit, vegetables, meat, etc.) that can be cut or otherwise reduced in portions. As will be described in detail in the discussion to follow, the exemplary embodiment of the present food processor device 10 is a lightweight and portable unit that includes a removable processing plate member 50 containing a cutting panel 52, best viewed in FIG. 7, that is slidably mounted within the device and made to move in a reciprocating fashion to cut, slice or grate the foodstuff. Depending upon the shape and configuration of the cutting panel 52, the present food processor device 10 can slice the foodstuff 54 into one or more relatively thin slices or slabs, or can "grate" the foodstuff into a plurality of smaller pieces. In discussing the present device 10, the term "slice" (or variants of that word) will be used to denote the formation of a single cutting or piece from the foodstuff 54 upon a single movement or "pass" of the cutting panel 52, whereas the term "grate" (or variants of that word) will be

1 used to denote the formation of plural cuttings from the foodstuff upon a
single movement or pass of the cutting panel across the foodstuff. However,
it must be appreciated that the cutting panel 52 can be constructed to
produce plural slices in a single pass, so that the terms slice and grate can
5 overlap to some degree.

Referring now particularly to FIGS. 1 and 2, the present food
processor device 10 is shown standing in a normal vertical attitude as the
device would be stored or otherwise positioned on a shelf or countertop (not
shown) in a kitchen area or like place where food is prepared. The present
10 food processor device 10 comprises an elongated housing 12 of plastic or
other lightweight yet durable material that is formed in a rigid shell-like
body, as described in greater detail below, that can support the mounting of
various components of the device and facilitate its intended hand-held
operation. The housing 12 is a thin-walled body having a substantially
15 hollow chamber that extends through the housing between a contoured upper
section 14 having a reduced cross section to allow easy handling by the user
and an expanded lower section 20 to accommodate the processing of food
within the device 10. The upper section 14 of housing 12 is open along its
front end and formed having a surrounding handle surface 16 ergonomically
20 shaped in a U-shaped configuration to fit the palm of the hand. A cap
member 18 is further attached at the top of the upper section 14 extending
across and over the handle surface 16 to provide a ledge-like surface that
facilitates gripping along the top of the housing 12 and maintains the user's
hand in proper position to manipulate the food processor device 10 during
25 operation.

1 The lower section 20 of the housing 12 is expanded in both
dimensions, front-to-back and side-to-side, relative to the upper section 14,
the increase in front-to-back dimension being most prominent, as better seen
in FIG. 3, so that the housing profile reflects somewhat of a bell-shaped
5 configuration. A forward compartment 22 projects from the bottom of lower
section 20, having a pair of sidewalls and a front wall formed in a
rectangular arrangement at the base of housing 12. The top and bottom of
the forward compartment 22 are both open to allow foodstuff being
processed to be fed into the compartment from above and discharged in a
10 processed state from the bottom of the compartment. A slotted opening 22a
provided across the front of the forward compartment 22 near its base allows
for insertion of the processing plate 50 into the bottom of housing 12 and for
the reciprocating passage therethrough in accordance with the operation of
the present food processor device 10.

15 A panel member 26, made of a thin yet rigid material, is vertically
disposed and secured within the lower section 20 of housing 12 along the
front edge thereof. This front panel member 26 is positioned so that it
passes through the rearward edge of the forward compartment 22 thereby
establishing a rear wall surface for the forward compartment. The front
20 panel member 26 is further provided with a slot 26a formed longitudinally
therethrough in a central position relative to the width of the panel. Slot 26a
and other associated openings formed on the rear side of the panel member
26, as best shown in FIG. 4 and described below in greater details, serve to
direct the vertical movement of a spring-driven press head 40 along the front
25 panel member 26 and through the forward compartment 22 in operation of
the food processor device 10. An elongated lever arm 30 having a grip-like

1 head 30a is pivotally mounted to the housing 12 and adapted to extend
substantially through the housing chamber secured upon a pivot rod 34 that
is connected between the side walls of the housing just above the top of front
panel member 26. The lever arm 30 is further coupled to the upper section
5 14 of housing 12 by a torsion spring 32 that biases the grip head 30a of the
lever arm outward from the open front end of the housing so that a
squeezing action upon the grip head will cause the lever arm to rotate about
pivot rod 34 and move through the chamber in a reciprocating fashion. As
described below in greater detail, this rotational movement of the lever arm
10 30 serves to produce and control the reciprocating passage of the processing
plate 50 through the bottom of forward compartment 22.

Referring now to FIGS. 3 and 5 in conjunction with FIGS. 1 and 2,
the lever arm 30 extends in length downward from grip head 30a in the form
of a substantially flat rod section that passes backward and through the
15 expanded lower section 20 of the housing 12 at an inclined attitude so that
the rod section is made to extend substantially parallel to the inclined rear
surface of the lower section when the lever arm is stationed in its normal
spring-biased position. A tapered tip portion 30b is further provided at the
bottom of the lever arm 30 and made to curve downward at an angle relative
20 to the flat rod section so that the tip portion is directed at and substantially
perpendicular to the bottom of housing 12. The torsion spring 32 is a
conventional coiled spring body further having a pair of extended legs 32a
and 32b that project from either end to apply the torque developed by the
coiled body under torsion between the lever arm 30 and housing 12. One of
25 the extended legs 32a projects rearward from the body of torsion spring 32
as it is mounted along pivot rod 34 to engage upon and press against the

1 inside wall of the handle surface 16 of upper section 14 while the other
extended leg 32b is made to project forward from the opposite end of the
coiled body of torsion spring 32 to engage upon and press against the inside
surface of the grip head 30a. This positional arrangement of the extended
5 legs 32a, 32b of torsion spring 32 and their pressing engagement between
the grip head 30a and upper section 14 of the housing 12 serves to spring-
load the lever arm 30 upon pivot rod 34 with a bias that urges the grip head
30a forwardly and outwardly from the front end of the upper section at an
acute angle relative thereto. Squeezing forces, therefore, applied by hand
10 between the grip head 30a and the handle surface 16 of the housing serve to
rotate the lever arm 30 back and forth about the pivot rod 34 and move the
lower part of the lever arm and its tapered tip portion 30b radially in a
reciprocal fashion through the chamber of the lower section 20 of the
housing.

15 The processing plate 50 inserted within the slot 22a at the bottom of
housing 12 is slidably contained therein and movable in a plane substantially
parallel to the base of the housing. Referring to FIG. 7 for a better view of
the processing plate 50, the body of the plate is a rigid planar member,
typically made of a plastic material, that is formed to provide a central
20 opening 50a into which a cutting panel 52 having sharp-edged perforations
formed across its surface is internally fitted and secured. The cutting panel
52 is made from a thin planar sheet of corrosion resistant metal, such as, for
example, stainless steel, or some other hard material capable of providing
the sharp-edged perforations. The processing plate 50 is preferably molded
25 in its entirety with the cutting panel 52 embedded therein and contained
within the central opening 50a. Alternatively, the processing plate 50 may

1 be laminated in construction comprising separate top and bottom planar
halves, each having respective central openings 50a, secured together about
the cutting panel 52. A separate keyway opening 50b is further provided
and formed through the processing plate 50 near to the rear edge of the
5 processing plate. The keyway opening 50b is aligned longitudinally with the
central opening 50a but relatively smaller than the central opening and more
rectangular in its configuration. As described below in greater detail, the
keyway opening 50b is designed and positioned to engage the tapered tip
portion 30b of lever arm 30 as it moves in a radial course through the lower
10 section 20 of housing 12 thereby causing longitudinal motion to be imparted
to the slidable processing plate 50.

The processing plate 50 is made slidable and guided in a longitudinal
direction by means of fitted containment within the slotted opening 22a of
the forward compartment 22 and further through the base of housing 12
15 along the inside walls thereof to the back surface thereof. As may be seen in
FIG. 5, separate tracks 12a that are spaced apart and made to extend along
opposite walls of the housing 12 project inwardly in substantial alignment
with the slotted opening 22a to contain the processing plate 50 on each side
and allow it to slide linearly back and forth and in a level plane through the
20 housing and beneath the forward compartment 22.

A flexible leaf spring member 36 is mounted approximately midway
along the inclined inner wall at the back of the lower housing section 20 and
made to extend inwardly and downwardly at an angle sufficient to press
upon the rearward side of the lower section of lever arm 30 in opposition to
25 the spring-loaded bias that is applied to the grip head 30a in the normal
stationary position of the lever arm. This spring force applied by the leaf

1 spring member 36 serves to place the tapered tip portion 30b of the lever
arm 30 in a position projecting just inside the plane of travel of processing
plate 50 and in direct vertical alignment with the keyway opening 50b at the
rear of the processing plate. In this "ready to operate" position, the lever
5 arm 30 and its tapered tip portion 30b is set for immediate engagement with
the keyway opening 30b and the resulting reciprocating movement of the
processing plate 50 in response to the radial motion of the lever arm. It
should be noted that this position of the tip portion 30b allows the
processing plate 50 to be fully inserted (with "Top" side up) into the bottom
10 of housing 12 through slotted opening 22a, the backward passage of the
processing plate meeting only slight resistance from the tip portion urged
forward by the leaf spring 36. With the lever arm 30 resting against the leaf
spring 36, the tip portion 30b yields by swinging backward until it aligns
with and engages the keyway opening 50b of the processing plate as it slides
15 fully into place within the bottom of the housing 12. When lined up with the
keyway opening 50b, the tip portion 30b of the lever arm 30 will suddenly
engage and protrude into the keyway opening, effectively latching the
processing plate with an audible clicking sound. It is further noted that by
rotating the grip head 30a forward slightly from its normal position
20 established by torsion spring 32, the lower section of the lever arm 30 and
particularly its tip portion 30b can be moved slightly against the pressure of
the leaf spring member 36 to raise the tip portion just above the plane of the
processing plate 50 and outside of the keyway opening 50b to allow the plate
to be easily removed from the housing 12 through slotted opening 22a.

25 Referring to FIG. 4 in conjunction with FIGS. 3 and 5, the press head
40 is operatively mounted upon the front panel member 26 of housing 12

1 with the press head being coupled to a second torsion spring 46, similar in its
construction to spring 32, to provide controlled linear movement of the press
head through and along slot 26a. The body of the press head 40 is a closed
rectangular member in its basic form, having an exterior profile, particularly
5 in its lateral cross section, that is sized to conform and fit closely within the
chamber of the forward compartment 22 at the base housing 12 so that it
may move longitudinally through the chamber without restriction or
jamming. Non-rectangular forms of the press head 40 having curvilinear or
cylindrical configurations may also be used subject to the stated conformity
10 of its exterior profile with the chamber of the forward compartment 22.
Contoured depressions or cutouts 40a symmetrically formed on either side
of the body of the press head 40 are positioned near the top of the press head
to better provide for gripping movement of the press head between the
forefinger and thumb of the user. Between the contoured depressions 40a on
15 the forward face of the press head 40, a slight boss or raised surface marking
may be provided to indicate the area upon which the user may press and
trigger the spring-loaded movement of the press head in accordance with the
operation of the present food processor device 10. Across the base of press
head 40, a ridged or textured bottom surface 40b is preferably formed and
20 provided to secure firm contact and engagement of foodstuff 54 placed
within the forward compartment 22 beneath the press head.

The press head 40 is mounted for travel within slot 26a and adapted to
be retained therein using a rectangular pad member 42 attached to the back
of the body of the press head through the slot with the front panel member
25 26 positioned intimately therebetween. The pad member 42, made of a rigid
yet resilient material, such as plastic, is sized, particularly in its width, to

1 span the width of slot 26a and is further made in its rectangular dimensions
to conform with and fit into a rectangular recess 26b formed at the top of the
slot on the rear side of the front panel member 26. A detent member 44,
similar in material to that of the pad member 42, is affixed to the inner face
5 of the pad member and made to project therefrom in the direction opposite to
and away from the front panel 26 and its slot 26a. The detent member 44 is
formed having a notched configuration that when juxtaposed and affixed to
the inner face of the pad member 42, provides a U-shaped slot that serves to
engage the torsion spring 46 mounted within the housing 12 at the back side
10 of the front panel member 26.

The torsion spring 46, like that of spring member 32, comprises a
coiled main body having a pair of extended legs 46a and 46b that project in
different radial directions from opposite ends of the coiled body. Extended
leg 46a in this case projects radially from the inward end of the mounted
15 torsion spring 46 in a direction that is substantially upright. In this position,
the inward end of the torsion spring 46 and the extended leg 46a projected
therefrom are fastened to the inner wall of the housing 12 via a mounting
plate 47 that supports the extended leg in the upright position and the coiled
body of the spring in a level attitude within the housing. The coil body of
20 the torsion spring 46 is mounted axially to the backside of panel member 26
at the side of slot 26a and about midway of its length using a fastening post
45 or like rod fastener. The fastening post 45 is sized to fit coaxially
through the coil body and is anchored into the panel member 26
substantially perpendicular thereto to maintain the level attitude of the
25 torsion spring 46 and allow its intended movement. The extended leg 46b of
torsion spring 46 nearest to the panel member 26 is intended for radial

1 movement about the axis of the torsion spring and is biased in its normal
projection downwardly from the axially mounted spring coil and forwardly
toward the panel member. The length of the extended leg 46b is sufficient to
reach the ends of slot 26a from the mounted position of the coil body of
5 torsion spring 46 and further allow passage through and engagement with
the U-shaped slot at the rear of pad member 42 as it moves along the slot in
panel member 26. The tip of the extended leg 46b is formed having a slight
downward radius that helps to maintain its engagement with the U-shaped
slot and apply the proper spring bias upon the pad member 42 particularly at
10 the top of slot 26a. With the biasing action of the torsion spring 46, best
seen in FIG. 4, the extended leg 46b is engaged through and upon the U-
shaped slot thereby urging downwardly and forwardly upon the pad member
42 and forcing the press head 40 to the bottom of slot 26a and the base of the
forward compartment 22. It is noted that the forward urging of the extended
15 leg 46b continuously presses the pad member 42 into the rear of panel
member 26 and thus allows the pad member to engage the recessed section
26b at the top of the slot 26a under the force of torsion spring 46, as
described in greater detail below.

The press head 40 is positionable atop the forward compartment 22 by
20 sliding the head upward along the front panel 26 within slot 26a, preferably
gripping the contoured depressions 40a on either side of head. This sliding
motion of the press head 40 toward the top of slot 26a is resisted by the
downward force exerted by the torsion spring 46 particularly acting through
its extended leg 46b engaged upon the pad member 42 and associated detent
25 member 44. At the top of slot 26a, the forward surface of pad member 42
engages the rectangular recessed section 26b, as shown in phantom outline

1 in FIG. 4, with the bottom edge of the tab member resting upon the bottom
ledge of the recessed section. This engagement of the pad member 42 with
the recessed section 26b, urged by the action of the torsion spring 46 and its
extended leg 46b, locks the press head 40 in its "loaded" position, as seen in
5 FIG. 3, subject to the continued downwardly and forwardly urging spring
force applied by the extended leg upon the back side of the pad member.
The press head 40 remains "loaded" in its uppermost position as long as the
pad member 42 remains engaged within the recessed section 26b. While in
this "loaded" position, foodstuff 54 can be inserted into the forward
10 compartment 22 beneath the raised level of the press head 40 in preparation
for its processing. When the foodstuff 54 is situated and ready for
processing, the press head 40 is released by pushing upon its forward surface
thereby deflecting the pad member 42 sufficiently rearward to disengage it
from the recessed section 26b. Once deflected and disengaged, the pad
15 member 42 is driven downward along the slot 26a under the urging of the
torsion spring 46 and particularly by movement of extended leg 46b which
rotates downward until the leg returns to its normal position at the bottom of
the slot. In so doing, the press head 40 with its ridged bottom surface 40b is
driven downward along the front panel member 26 and upon the foodstuff
20 54 in the forward compartment 22, forcing the foodstuff therethrough for
processing and discharge from the bottom of housing 12.

Referring now to FIG. 6, the base 24 of housing 12 is made to provide
a forward opening 24a that is aligned with the ridged bottom surface 40b of
press head 40 and positioned beneath the forward compartment 22. The
25 forward opening 24a is sized and shaped to substantially conform with the
bottom surface 40b the press head 40 in its cross sectional configuration and

1 serves to allow the foodstuff 54 placed in the forward compartment 22 to be
passed through the compartment under the force of the spring-driven press
head and onto the processing plate 50 reciprocating below. A separate
elongated rearward opening 24b is further formed in the base 24 of housing
5 12 and made to extend substantially to the back edge of the housing
longitudinally through the central portion of the housing base. The rearward
opening 24b is generally longer in dimension than the forward opening 24a
and is preferably shaped in a substantially rectangular configuration as
shown in FIG. 6, with sufficient length and width to the opening so as to
10 permit full and unrestricted passage therethrough of the tip portion 30b and
lower section of lever arm 30 as it moves in a radial course during squeezed
actuation of the lever arm 30. The back edge of the rearward opening 24b is
particularly positioned so as to be aligned with the tapered tip portion 30b of
the lever arm 30 in its "ready to operate" position, mentioned above, and to
15 provide for immediate engagement between the tip portion and the keyway
opening 50b of the processing plate 50 when the plate is fully and
rearwardly seated in the bottom of the housing 12.

Referring now more particularly to FIGS. 8 and 9 in conjunction with
those figures previously discussed, the operation of the present food
20 processor device 10 can be presented accordingly. In the standing position
of processor device 10, as seen and described before with respect to FIGS. 1,
3 and 5, lever arm 30 is poised in its "ready to operation" position, (in dotted
outline in FIG. 9), press head 40 is locked in its "loaded" position, and
operation of the device is ready to proceed as intended by hand. Processing
25 plate 50 with its selected cutting panel 52 contained therein is inserted by the
user through forward slot 22a and fully seated to the rear of housing 12 so

1 that the keyway opening 50b is immediately aligned with and partially
engaged by the tapered tip portion 30b of the lever arm 30. It should be
noted that the cutting panel 52 is selected by the user based upon the type of
grating or slicing that is intended to be effected for each particular instance
5 of use of the processor device 10.

The article of foodstuff 54 intended for processing is then placed in
the chamber of the forward compartment 22 beneath the "loaded" press head
40, the press head being held in such position by the forwardly directed
force of the extended leg 46b of torsion spring 46 that is applied to pad
10 member 42 as it is engaged within the rectangular recessed section 26b on
the rear of panel member 26. At this point in the sequence of operation of
the present food processor device 10, the foodstuff 54 is resting in the
forward compartment over the forward opening 24a in the base 24 of
housing 12 and immediately beneath the ridged bottom surface 40b of the
15 press head 40. Pressing slightly upon the forward surface of the press head
40 counteracts the inward exerted spring force applied by extended leg 46b
and disengages the pad member 42 from the recessed section 26b to allow
the downwardly exerted force further applied by the leg of torsion spring 46
to start the pad member 42 and the press head 40 connected thereto
20 downward along slot 26a with the ridged surface 40b of the press head
immediately contacting the foodstuff and pressing it downward in the
chamber of forward compartment 22. With the press head 40 released as
such from its "loaded" position, the foodstuff 54 beneath in the forward
compartment 22 is clamped and urged with a steady force toward the
25 forward opening 24a in the base 24 of housing 12 and directly onto the
cutting panel 52 resting immediately beneath in the processing plate 50.

1 With the foodstuff 54 clamped within the forward compartment 22,
the user grips the upper section 14 of the housing 12, placing one hand H
(shown in phantom in FIG. 8) with its forefinger and thumb upward about
the handle surface 16 just beneath cap member 18 so that the palm of the
5 hand wraps about the outer surface with the fingers extending onto the grip
head 30a of the lever arm 30. Gripping upper section 14 of the housing 12
as such, the user then squeezes the fingers of the gripping hand H onto the
grip head 30a thus drawing the grip head into the open front end of the upper
section against the biasing force of torsion spring 32. As this squeezing
10 action of the hand H is initiated upon the grip head 30a, the lever arm 30
proceeds to rotate about pivot rod 34 and cause the tapered tip portion 30b to
move in a radial course immediately into and through the keyway opening
50b on the processing plate 50. Forward travel of the processing plate 50
thus proceeds through the base of housing 12 and outward from slot 22a
15 with the cutting panel 52 making an associated pass on the foodstuff 54 as it
is urged downward through the forward compartment 22 by the spring-
driven press head 40. With this forward pass of the processing plate 50 and
its cutting panel 52 on the foodstuff 54, a grated, sliced or otherwise reduced
portion of the foodstuff is produced and discharged from the base 24 of the
20 housing 12 through the forward opening 24a therein. Upon completion of
the initial squeezing action of the hand H, as shown in both FIGS. 8 and 9,
the grip head 30a is released, while remaining in contact with the fingers of
the user, to allow the lever arm 30 to return to its bias position by way of
torsion spring 32 and in so doing, to draw the processing plate 50 back into
25 the housing 12 under the continued engagement of the keyway opening 50b
by tip portion 30b. This releasing action upon the grip head 30a effects a

1 return pass on the foodstuff 54 by cutting panel 52 to further remove and
discharge reduced portions thereof. Repeated squeezing and releasing
actions of the hand H on the grip head 30a of lever arm 30 will thus cause
the reciprocating passage of the processing plate 50 and its cutting panel 52
5 through and across the foodstuff 54 loaded into the forward compartment 22
and allow the immediate delivery of sufficient amounts of the foodstuff in its
desired form.

Press head 40 will continue to urge the foodstuff 54 through the
forward compartment 22 and onto the reciprocating processing plate 50 until
10 the press head reaches the bottom of slot 26a or the press head is returned
sooner to its "loaded" position at the top of the slot. Upon completion of any
instance of use of the food processor device 10, excess foodstuff 54 may be
easily removed from the forward compartment 22 by withdrawing the press
head 40 to its original locked position. The processing plate 50 may also be
15 removed from the housing 12 for cleaning or replacement by means of
reverse pivoting the lever arm 30 slightly against the leaf spring 36 to left
the tip portion 30b completely from the keyway opening 50b and allow the
processing plate to be withdrawn from slot 22a.

Therefore, it is apparent that the described invention provides an
20 improved hand-held food processor for cutting, slicing, shredding or grating
of foodstuffs. More particularly, the present invention provides an improved
food processing device that can be effectively operated by hand to cut, grate
or shred a variety of foodstuffs in a wide range of sizes and do so in a
portable manner so that the processed foodstuff may be delivered within
25 reach of the user. The described food processor is made to be completely
portable in its use and is easy to handle and manipulate during its operation.

1 The present hand-held food processor is particularly lightweight and easy to
use, being effective in its operation without need for electrical power. In
addition, the described hand-held food processor is simple in construction
yet reliable in its operation and is configured for easy storage and cleaning.

5 Obviously, other embodiments and modifications of the present
invention will readily come to those of ordinary skill in the art having the
benefit of the teachings presented in the foregoing description and drawings.
Alternate embodiments of different shapes and sizes, as well as substitution
of known materials or those materials, which may be developed at a future
10 time to perform the same function as the present described embodiment, are
therefore considered to be part of the present invention. Accordingly, it is
understood that this invention is not limited to the particular embodiment
described, but rather is intended to cover modifications within the spirit and
scope of the present invention as expressed in the appended claims.